FULLER ENGINEERING & LAND SURVEYING, LLC
525 John Street • Second Floor
Bridgeport, CT 06604
(203) 333-9465 (203) 336-1769 FAX

ENGINEERING REPORT

Project Name:

Madison Place
Luxury Townhouse Development
18 Powerhouse Road &
145 CT Route 32
Montville, CT

Information prepared for:

JNE Holdings, LLC
&
Town of Montville
Department of Public Works / Engineering Department

Dated: January 11 February 2025
Revised 7 March 2025

FULLER ENGINEERING & LAND SURVEYING, LLC
525 JOHN STREET 2ND FLOOR BRIDGEPORT, CONNECTICUT 06604
PHONE (203)333-9465; FAX (203)336-1769

TABLE OF CONTENTS (Stormwater Study)

PHASE 1

PHASE 2

FULLER ENGINEERING & LAND SURVEYING, LLC
525 John Street – Second Floor – Bridgeport, CT 06604

Phone: (203) 333-9465 Fax: (203) 336-1769

STORMWATER STUDY

APPLICANT: JNE HOLDINGS, LLC

PROJECT LOCATION: WILTONS WAY 18 Powerhouse Road & 145 Route 32, Montville, Connecticut

INTRODUCTION

The proposed project consists of the merger of two parcels into one lot consisting of 110,146 S.F.:

145 CT Route 23
Site Area: 59,415 S.F.
One existing 4 family residential unit.

18 Powerhouse Road
Site Area 50,731 S.F.
One existing 2 family residential unit.

The proposed project is anticipated to be constructed in three phases. The drainage computations for this project are separated into two groups;

Drainage Study 1 (Phase 1 sitework);
Drainage Study 2 (Phase 2 and 3 sitework.)

DRAINAGE STUDY Phase 1

NARRATIVE

The subject of this report is a 1.337-(disturbed area) acre portion of a parcel located at 145 Route 32 in Montville, constituting Phase 1 of the proposed project. The purpose of this report is to determine the existing and proposed runoffs resulting from the proposed site improvements in order to design a stormwater management system.

PRE-DEVELOPMENT CONDITIONS

The subject parcel is located on the west side of Route 32, at its intersection with Powerhouse Road. The lot currently contains buildings and a driveway.. The lot slopes moderately to steeply across its width, generally from the west to the east.

Existing soils at this location, as identified in the NRCS Soil Survey of Fairfield County, Connecticut, consist of Narragansett silt loam, 2 to 8 percent slopes, which has a Hydrologic classification of "B".

The existing runoff from a 100-Year rainfall event is 7.01 c.f.s.

PROPOSED POST-DEVELOPMENT CONDITIONS

The following computations of the existing and proposed conditions runoff flows were derived from the HydroCAD computer software. HydroCAD follows the NRCS TR-20 procedure for computing stormwater runoff. Computations were performed for a 100-year storm event, which has a 2% chance of occurring in any given 12 month period.

CALCULATIONS

The following computations of the existing and proposed conditions runoff flows were derived from the HydroCAD computer software. HydroCAD follows the NRCS TR-20 procedure for computing stormwater runoff. Computations were performed for a 100-year storm event, which has a 2% chance of occurring in any given 12-month period.

The proposed runoff (prior to mitigation) from a 100-Year rainfall event is 7.94 c.f.s.

Existing Conditions (Phase 1):

Buildings	1,072 s.f.	CN 98
Driveway	1,107 s.f.	CN 98
Concrete slab	243 s.f.	CN 98
Lawn	55,821 s.f.	CN 69
Total	58,243 s.f.	

Weighted CN - 70

Proposed Conditions (Phase 1):

Building	4,741 s.f.	CN 98
Driveway/Parking	9,018 s.f.	CN 98
Lawn	44,484 s.f.	CN 69
Total	58,243 s.f.	

Weighted CN - 76

Groundwater Recharge Volume (GWV):

Impervious area = 23.6 %

WQV = (0.2624 * 1.337 ac)/12 x 1.3 = 0.03800645 ac-ft = 1,655.6 ft^3

GWV = 1,655.6 * 0.25 = 413.9 ft^3

SUMMARY:

	100 Year	50 Year	25Yr.	10Yr.	5Yr.	2Yr.
Existing Runoff :	7.01	5.89 c.f.s	4.80	3.43	2.50	1.46
Proposed Runoff :	7.94	6.79 c.f.s.	5.67	4.22	3.21	2.04
Runoff Retained:	1.70	1.51 c.f.s.	1.33	1.09	0.92	0.71
Areas Bypassing Retention Plus overflow:	6.08	5.24c.f.s.	4.31	3.13	2.31	1.39

CONCLUSION

The increased runoff resulting from the proposed site improvements will be retained in an on-site retention system. The runoff from the driveway will be routed to 108 linear feet of 48" concrete galleries. The increase in stormwater runoff is mitigated on-site.

This system will reduce the net peak run-off during a 100 Year (2%) rainfall event to 6.08 c.f.s. from its current peak of 7.01 c.f.s.

The bottom of the concrete galleries will be at elevation 93.9. No restrictive layer was found to an elevation of 92.0.

The proposed retention system provides a total of 1,802 ft3 of storage, which will be adequate to maintain the net runoff during a 100 Year rainfall event, meets the Water Quality Volume and will provide groundwater recharge.

The maximum peak net runoff from the proposed conditions decrease compared to the peak runoff from the existing conditions for each of the rainfall events from the 2 Year to the 100 Year rainfall events, as the table above illustrates.

The proposed improvements will have no adverse impact on surrounding properties.

STORMWATER STUDY Phases 2 and 3

NARRATIVE:

The subject of this report is a 1.185 acre portion (Disturbed Area of Phases 2 and 3) of a parcel located at 145 Route 32 in Montville, constituting Phases 2 and 3 of the proposed project. The purpose of this report is to determine the existing and proposed runoffs resulting from the proposed site improvements in order to design a stormwater management system.

PRE-DEVELOPMENT CONDITIONS

The subject parcel is located on the west side of Route 32, at its intersection with Powerhouse Road. The lot currently contains buildings and a driveway. The lot slopes moderately to steeply across its width, generally from the west to the east.

Existing soils at this location, as identified in the NRCS Soil Survey of Fairfield County, Connecticut, consist of Narragansett silt loam, 2 to 8 percent slopes, which has a Hydrologic classification of "B".

The existing runoff from a 100-Year rainfall event is 6.06 c.f.s.

PROPOSED CONDITIONS:

The proposal for this phase is to construct 8 residential units (4 units in Phase 2 and 4 units in Phase 3), with associated driveway, site utilities, and miscellaneous site improvements.

The proposed runoff (prior to mitigation) from a 100-Year rainfall event is 6.87 c.f.s.

CALCULATIONS:

The following computations of the existing and proposed conditions runoff flows were derived from the HydroCAD computer software. HydroCAD follows the NRCS TR-20 procedure for computing stormwater runoff. Computations were performed for a 100-year storm event, which has a 2% chance of occurring in any given 12-month period.

The proposed runoff (prior to mitigation) from a 100-Year rainfall event is 6.87 c.f.s.

Existing Conditions (Phases 2 and 3):

Lawn	51,610 s.f.	CN 69
Total	51,610 s.f.	

Weighted CN 69

Proposed Conditions (Phases 2 and 3):

Buildings	12,169 s.f.	CN 98
Driveway/Parking	10,597 s.f.	CN 98
Lawn	28,844 s.f.	CN 69
Total -	51,610 s.f.	

Weighted CN 82

Groundwater Recharge Volume (GWV):

Impervious area = 44.1 %
WQV = (0.4469 * 1.185 ac)/12 x 1.3 = 0.0573707 ac-ft = 2,499.1 ft^3
GWV = 2,499.1 * 0.25 = 624.8 ft^3

SUMMARY:

	100 Year	50 Year	25Yr.	10Yr.	5Yr.	2Yr.
Existing Runoff :	6.06	5.08 c.f.s	4.13	2.93	2.11	1.21
Proposed Runoff :	7.77	6.75 c.f.s.	5.75	4.43	3.49	2.38
Runoff Retained:	3.26	2.91 c.f.s.	2.56	2.10	1.77	1.37
Areas Bypassing Retention Plus overflow:	5.21	3.82 c.f.s.	3.17	2.33	1.75	1.08

CONCLUSIONS:

The increased runoff resulting from the proposed site improvements will be retained in an on-site retention system. The runoff from the driveway and the roof of the northern building will be routed to 224 linear feet of 48" concrete galleries. The increase in stormwater runoff is mitigated on-site.

This system will reduce the net peak run-off during a 100 Year (2%) rainfall event to 5.21 c.f.s. from its current peak of 6.06 c.f.s.

The bottom of the concrete galleries will be at elevation 98.6. No restrictive layer was found to an elevation of 97.0.

The proposed retention system provides a total of 3,643 ft3 of storage, which will be adequate to maintain the net runoff during a 100 Year rainfall event, meets the Water Quality Volume and will provide groundwater recharge.

The maximum peak net runoff from the proposed conditions decrease compared to the peak runoff from the existing conditions for each of the rainfall events from the 2 Year to the 100 Year rainfall events, as the table above illustrates.

The proposed improvements will have no adverse impact on surrounding properties.

SOIL EROSION AND SEDIMENTATION CONTROL (All Phases)

For temporary condition or during construction a silt fence shall be provided along the property lines. Anti-tracking aprons shall be provided at all access routes from the site to the public road. A temporary diversion berm with stone check dams @ 50 ft o.c. shall be maintained and relocated as required during construction. All planting areas shall be protected with slope stabilization measures.

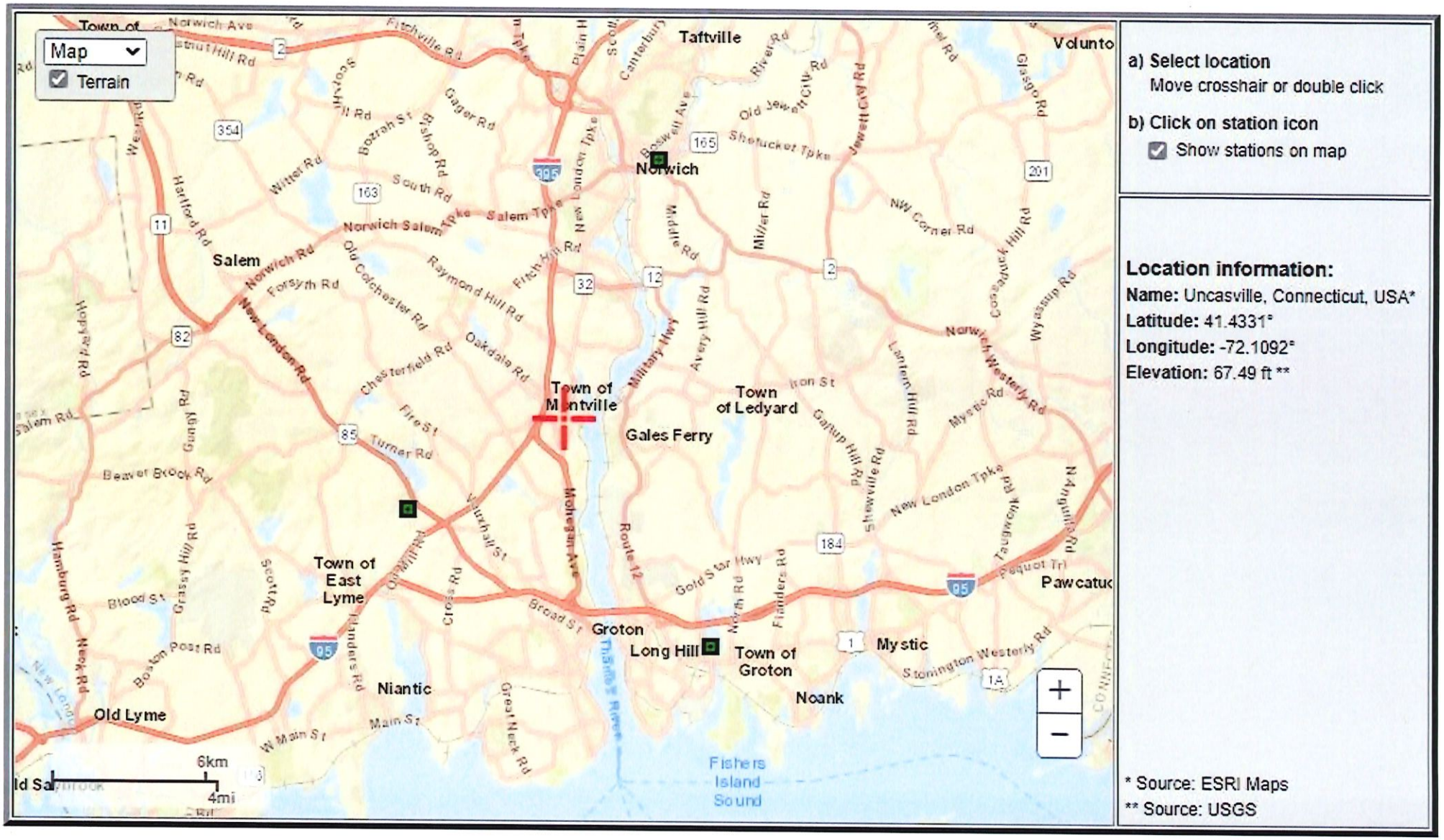
For permanent condition, all embankments, after being stabilized, shall be seeded to lawn or seed mixture as specified. Newly planted areas shall be covered with straw or erosion control blankets.

APPENDIX "A"

MONTVILLE PRECIPITATION FREQUENCY (PF)
RAINFALL DATA

NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CT

#245 Norwich New London Road (CT State RTE. 32) Montville, CT



NOAA Atlas 14, Volume 10, Version 3
Location name: Uncasville, Connecticut, USA*
Latitude: 41.4331°, Longitude: -72.1092°
Elevation: 67.49 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.340 (0.266-0.427)	0.406 (0.317-0.510)	0.514 (0.400-0.648)	0.604 (0.467-0.763)	0.727 (0.545-0.952)	0.820 (0.601-1.09)	0.918 (0.654-1.26)	1.03 (0.693-1.43)	1.19 (0.770-1.70)	1.32 (0.835-1.91)
10-min	0.482 (0.377-0.605)	0.576 (0.449-0.723)	0.729 (0.567-0.918)	0.856 (0.662-1.08)	1.03 (0.772-1.35)	1.16 (0.853-1.55)	1.30 (0.926-1.78)	1.46 (0.982-2.02)	1.68 (1.09-2.40)	1.87 (1.18-2.71)
15-min	0.567 (0.443-0.712)	0.677 (0.529-0.851)	0.857 (0.667-1.08)	1.01 (0.779-1.27)	1.21 (0.908-1.59)	1.37 (1.00-1.82)	1.53 (1.09-2.10)	1.71 (1.16-2.38)	1.98 (1.28-2.83)	2.20 (1.39-3.19)
30-min	0.803 (0.627-1.01)	0.958 (0.747-1.20)	1.21 (0.942-1.53)	1.42 (1.10-1.80)	1.71 (1.28-2.24)	1.93 (1.41-2.57)	2.16 (1.54-2.96)	2.42 (1.63-3.36)	2.79 (1.81-3.99)	3.10 (1.96-4.50)
60-min	1.04 (0.811-1.30)	1.24 (0.966-1.56)	1.57 (1.22-1.97)	1.84 (1.42-2.32)	2.21 (1.66-2.89)	2.49 (1.83-3.32)	2.79 (1.99-3.82)	3.12 (2.10-4.34)	3.61 (2.34-5.15)	4.01 (2.53-5.81)
2-hr	1.36 (1.08-1.70)	1.63 (1.28-2.03)	2.05 (1.61-2.57)	2.41 (1.88-3.02)	2.90 (2.19-3.77)	3.26 (2.41-4.31)	3.65 (2.62-4.97)	4.10 (2.78-5.65)	4.75 (3.09-6.72)	5.28 (3.36-7.59)
3-hr	1.58 (1.25-1.96)	1.89 (1.49-2.34)	2.38 (1.88-2.96)	2.79 (2.19-3.48)	3.35 (2.54-4.34)	3.78 (2.81-4.97)	4.22 (3.05-5.73)	4.74 (3.22-6.50)	5.49 (3.59-7.74)	6.12 (3.90-8.75)
6-hr	2.01 (1.60-2.47)	2.39 (1.90-2.94)	3.00 (2.39-3.70)	3.51 (2.78-4.35)	4.22 (3.22-5.41)	4.75 (3.55-6.19)	5.30 (3.85-7.13)	5.95 (4.07-8.08)	6.89 (4.52-9.61)	7.67 (4.91-10.9)
12-hr	2.48 (2.00-3.02)	2.94 (2.36-3.59)	3.69 (2.96-4.52)	4.31 (3.44-5.30)	5.17 (3.98-6.58)	5.81 (4.38-7.52)	6.49 (4.74-8.65)	7.28 (5.00-9.80)	8.42 (5.55-11.6)	9.37 (6.02-13.2)
24-hr	2.90 (2.36-3.51)	3.46 (2.80-4.18)	4.36 (3.53-5.30)	5.12 (4.11-6.24)	6.15 (4.77-7.77)	6.93 (5.26-8.89)	7.75 (5.71-10.3)	8.71 (6.02-11.6)	10.1 (6.71-13.9)	11.3 (7.31-15.7)
2-day	3.25 (2.66-3.89)	3.91 (3.20-4.69)	4.99 (4.06-6.00)	5.88 (4.77-7.11)	7.12 (5.57-8.92)	8.03 (6.15-10.3)	9.02 (6.71-11.9)	10.2 (7.09-13.5)	12.0 (7.97-16.3)	13.5 (8.75-18.6)
3-day	3.52 (2.90-4.20)	4.23 (3.48-5.06)	5.40 (4.43-6.47)	6.37 (5.19-7.66)	7.70 (6.06-9.62)	8.69 (6.69-11.0)	9.76 (7.29-12.8)	11.0 (7.70-14.5)	13.0 (8.66-17.5)	14.6 (9.51-20.0)
4-day	3.78 (3.12-4.50)	4.53 (3.74-5.39)	5.75 (4.73-6.87)	6.77 (5.53-8.12)	8.17 (6.45-10.2)	9.21 (7.11-11.7)	10.3 (7.73-13.5)	11.7 (8.15-15.3)	13.7 (9.16-18.4)	15.4 (10.0-21.0)
7-day	4.50 (3.75-5.33)	5.32 (4.43-6.30)	6.66 (5.52-7.90)	7.77 (6.40-9.26)	9.30 (7.38-11.5)	10.4 (8.10-13.1)	11.7 (8.75-15.1)	13.1 (9.20-17.0)	15.2 (10.2-20.3)	17.0 (11.1-23.1)
10-day	5.22 (4.37-6.15)	6.08 (5.08-7.16)	7.48 (6.22-8.83)	8.64 (7.14-10.2)	10.2 (8.16-12.5)	11.4 (8.90-14.2)	12.7 (9.55-16.3)	14.2 (9.99-18.4)	16.3 (11.0-21.6)	18.0 (11.8-24.3)
20-day	7.42 (6.26-8.66)	8.33 (7.03-9.74)	9.83 (8.25-11.5)	11.1 (9.23-13.0)	12.8 (10.2-15.4)	14.1 (11.0-17.2)	15.4 (11.5-19.3)	16.8 (11.9-21.5)	18.7 (12.7-24.6)	20.1 (13.3-26.9)
30-day	9.25 (7.85-10.7)	10.2 (8.65-11.9)	11.8 (9.92-13.7)	13.0 (10.9-15.3)	14.8 (11.9-17.7)	16.2 (12.7-19.6)	17.5 (13.1-21.7)	18.9 (13.5-24.0)	20.5 (14.0-26.8)	21.7 (14.4-28.9)
45-day	11.5 (9.82-13.3)	12.5 (10.7-14.5)	14.1 (12.0-16.4)	15.5 (13.1-18.0)	17.4 (14.0-20.7)	18.9 (14.8-22.7)	20.3 (15.2-24.8)	21.5 (15.4-27.2)	23.0 (15.7-29.9)	24.0 (15.9-31.7)
60-day	13.4 (11.5-15.4)	14.4 (12.3-16.6)	16.2 (13.8-18.7)	17.6 (14.9-20.4)	19.6 (15.8-23.1)	21.1 (16.6-25.3)	22.6 (16.9-27.5)	23.8 (17.1-30.0)	25.2 (17.3-32.6)	26.1 (17.4-34.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

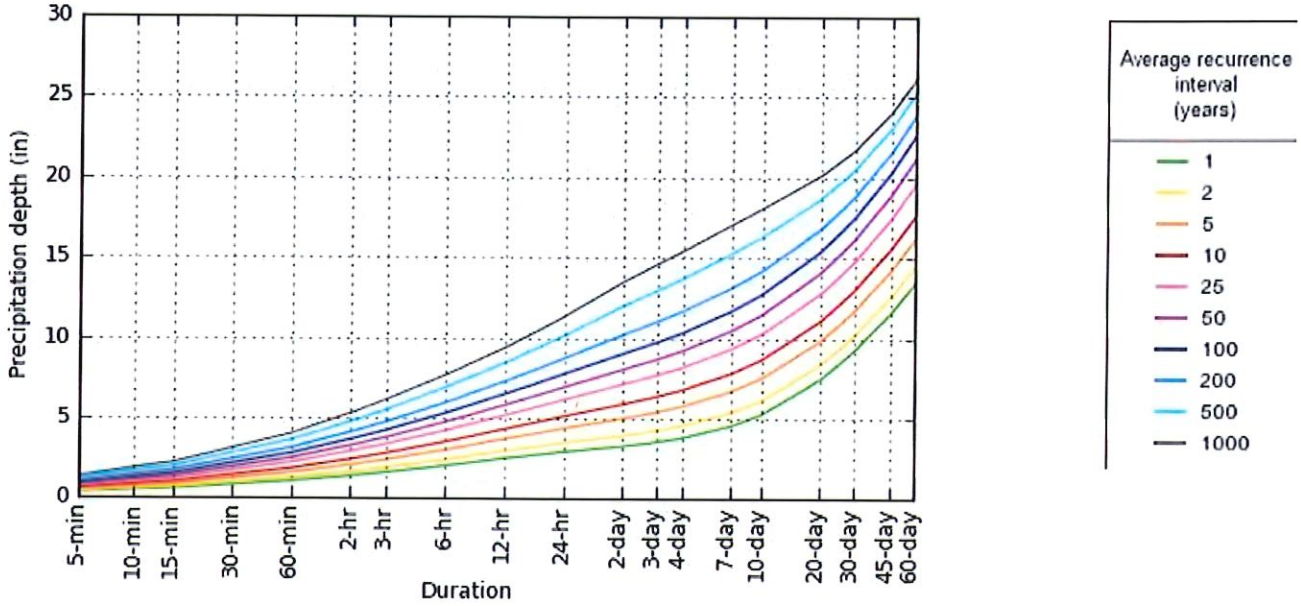
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

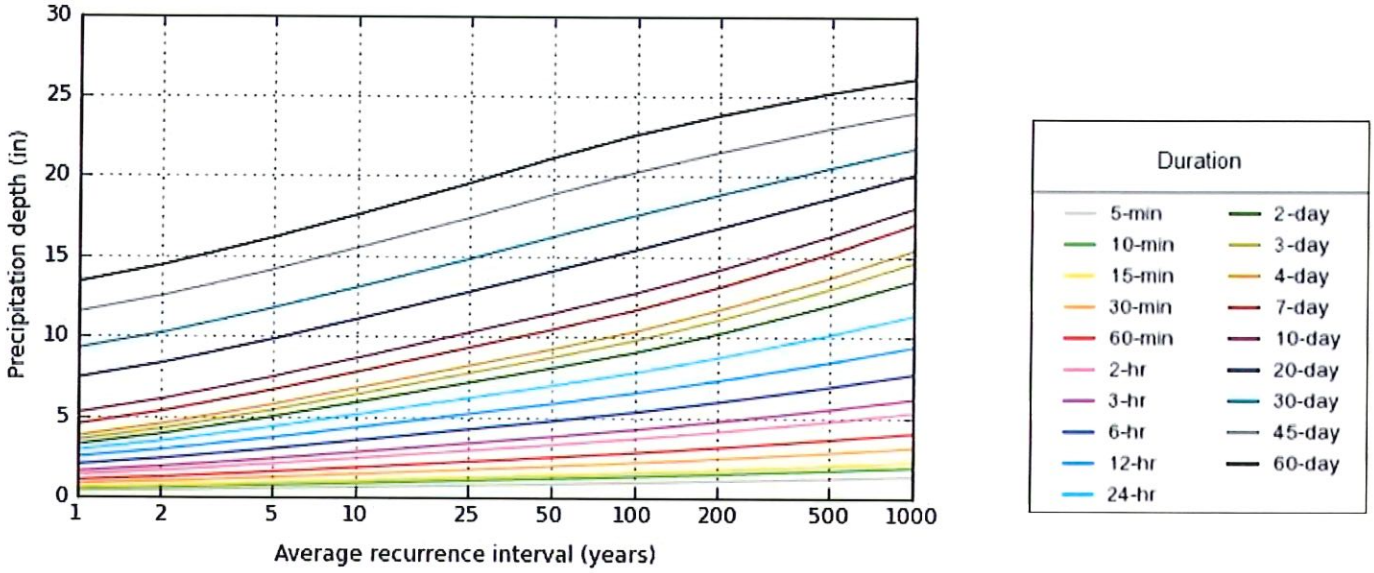
Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 41.4331°, Longitude: -72.1092°





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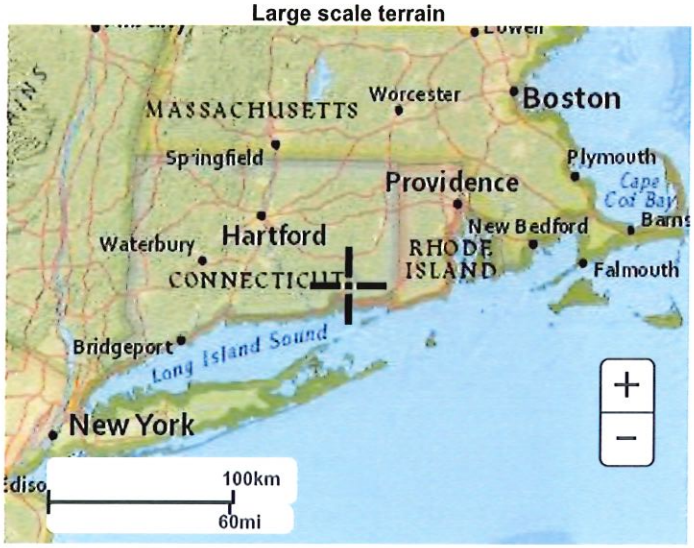
Created (GMT): Thu Jan 20 18:50:23 2022

Back to Top

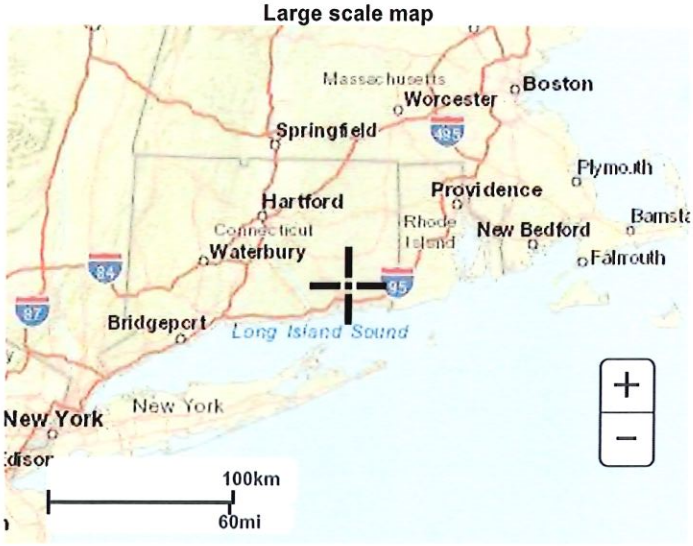
Maps & aerials

Small scale terrain

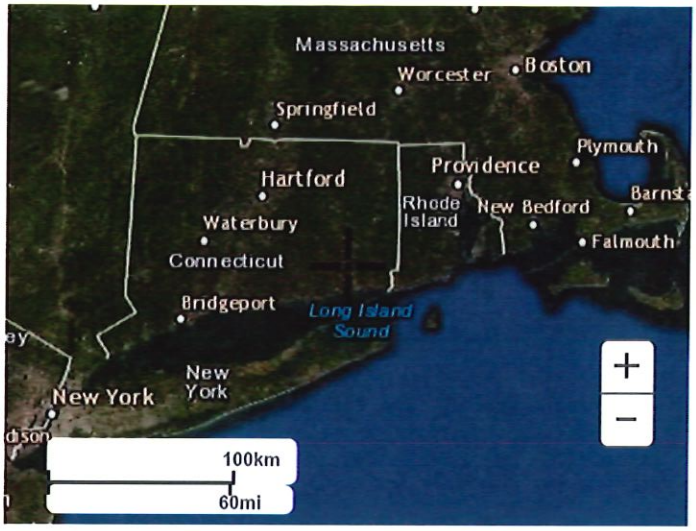
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX "B"

NRCS SOIL MAP AND HYDROLOGIC SOIL GROUP RATINGS

Map Scale: 1:894 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut, Eastern Part
Survey Area Data: Version 2, Aug 30, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

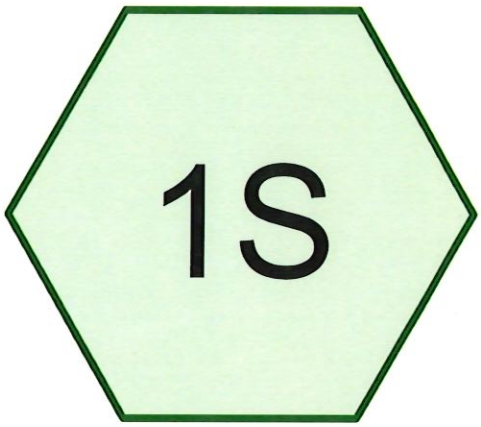
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

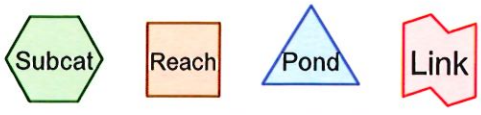
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
38C	Hinckley loamy sand, 3 to 15 percent slopes	0.1	3.2%
66B	Narragansett silt loam, 2 to 8 percent slopes	2.4	96.0%
68C	Narragansett silt loam, 3 to 15 percent slopes, extremely stony	0.0	0.7%
Totals for Area of Interest		**2.5**	**100.0%**

APPENDIX "C"

HYDROCAD ANALYSIS
PHASE 1



Existing Conditions



Summary for Subcatchment 1S: Existing Conditions

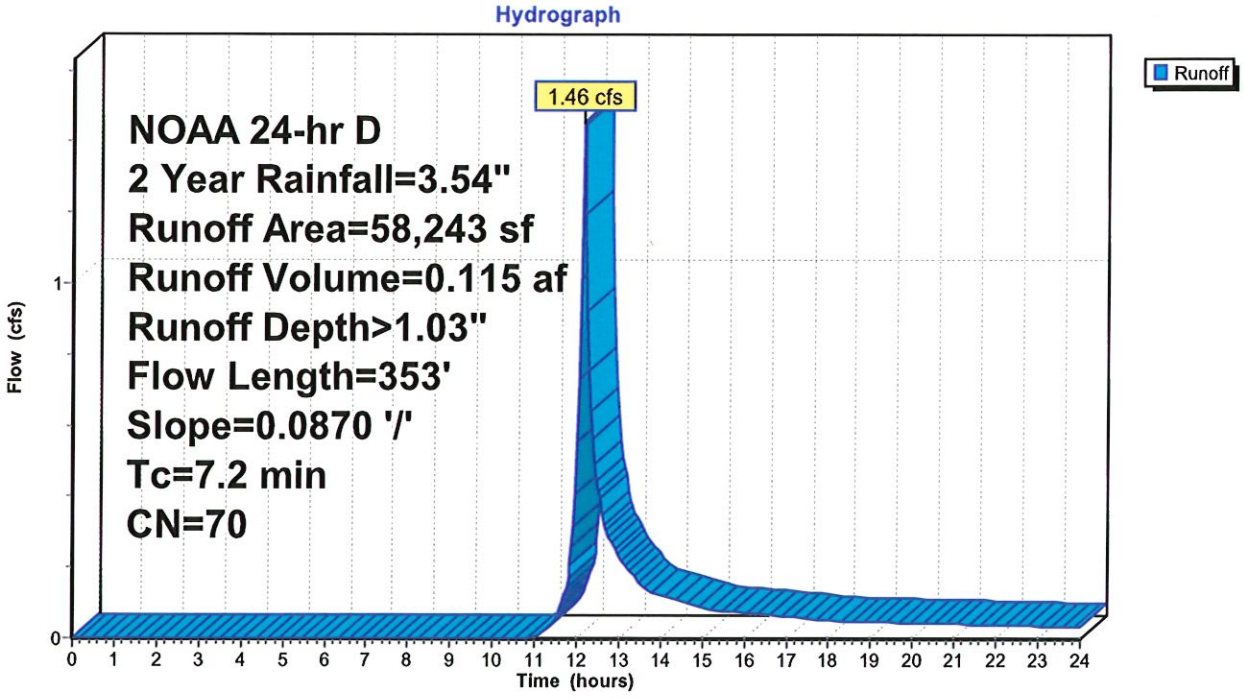
Runoff = 1.46 cfs @ 12.15 hrs, Volume= 0.115 af, Depth> 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 2 Year Rainfall=3.54"

	Area (sf)	CN	Description
*	1,072	98	Buildings
*	1,107	98	Driveway
*	243	98	Concrete slab
	55,821	69	50-75% Grass cover, Fair, HSG B
	58,243	70	Weighted Average
	55,821		95.84% Pervious Area
	2,422		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 1S: Existing Conditions



Summary for Subcatchment 1S: Existing Conditions

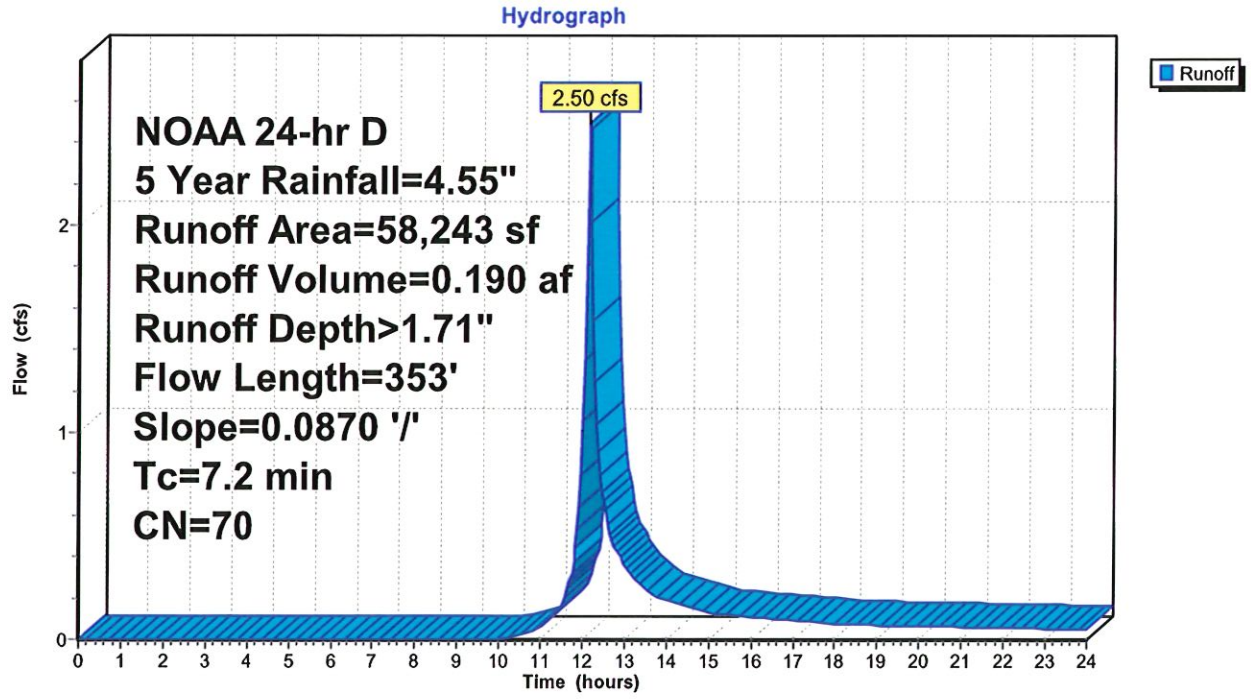
Runoff = 2.50 cfs @ 12.15 hrs, Volume= 0.190 af, Depth> 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 5 Year Rainfall=4.55"

	Area (sf)	CN	Description
*	1,072	98	Buildings
*	1,107	98	Driveway
*	243	98	Concrete slab
	55,821	69	50-75% Grass cover, Fair, HSG B
	58,243	70	Weighted Average
	55,821		95.84% Pervious Area
	2,422		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 1S: Existing Conditions



Summary for Subcatchment 1S: Existing Conditions

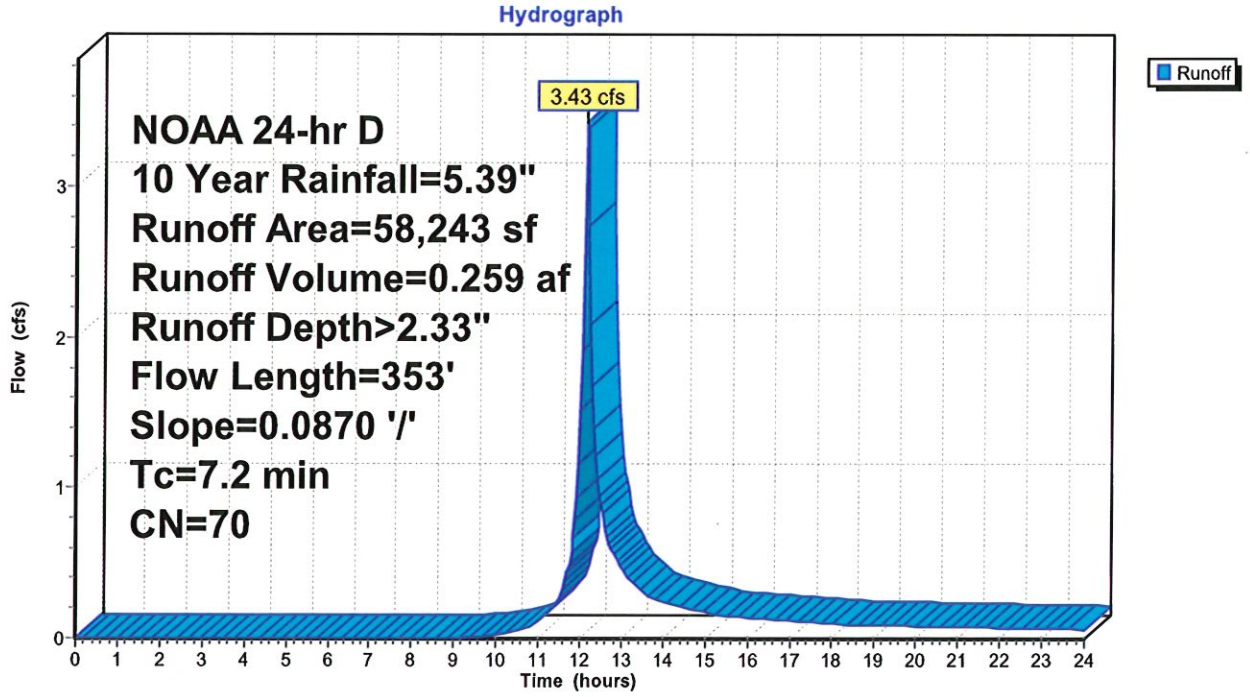
Runoff = 3.43 cfs @ 12.15 hrs, Volume= 0.259 af, Depth> 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 10 Year Rainfall=5.39"

	Area (sf)	CN	Description
*	1,072	98	Buildings
*	1,107	98	Driveway
*	243	98	Concrete slab
	55,821	69	50-75% Grass cover, Fair, HSG B
	58,243	70	Weighted Average
	55,821		95.84% Pervious Area
	2,422		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 1S: Existing Conditions



Summary for Subcatchment 1S: Existing Conditions

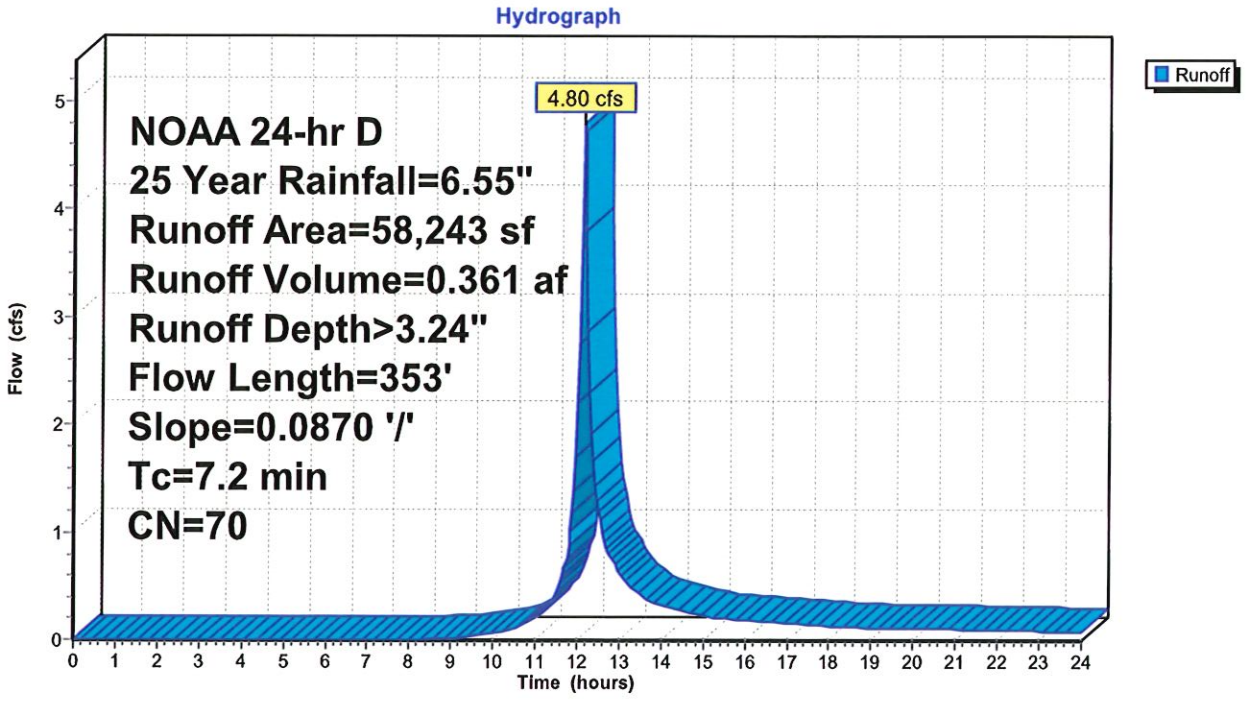
Runoff = 4.80 cfs @ 12.15 hrs, Volume= 0.361 af, Depth> 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 25 Year Rainfall=6.55"

	Area (sf)	CN	Description
*	1,072	98	Buildings
*	1,107	98	Driveway
*	243	98	Concrete slab
	55,821	69	50-75% Grass cover, Fair, HSG B
	58,243	70	Weighted Average
	55,821		95.84% Pervious Area
	2,422		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 1S: Existing Conditions



Summary for Subcatchment 1S: Existing Conditions

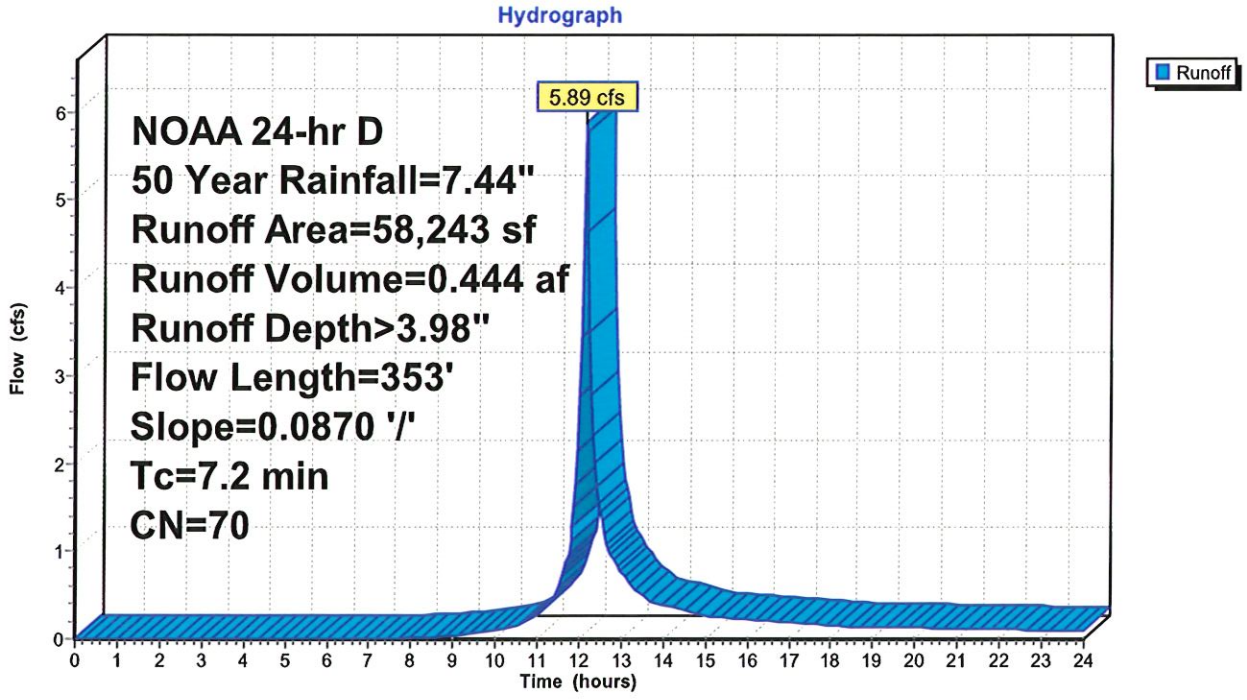
Runoff = 5.89 cfs @ 12.14 hrs, Volume= 0.444 af, Depth> 3.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 50 Year Rainfall=7.44"

	Area (sf)	CN	Description
*	1,072	98	Buildings
*	1,107	98	Driveway
*	243	98	Concrete slab
	55,821	69	50-75% Grass cover, Fair, HSG B
	58,243	70	Weighted Average
	55,821		95.84% Pervious Area
	2,422		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 1S: Existing Conditions



Summary for Subcatchment 1S: Existing Conditions

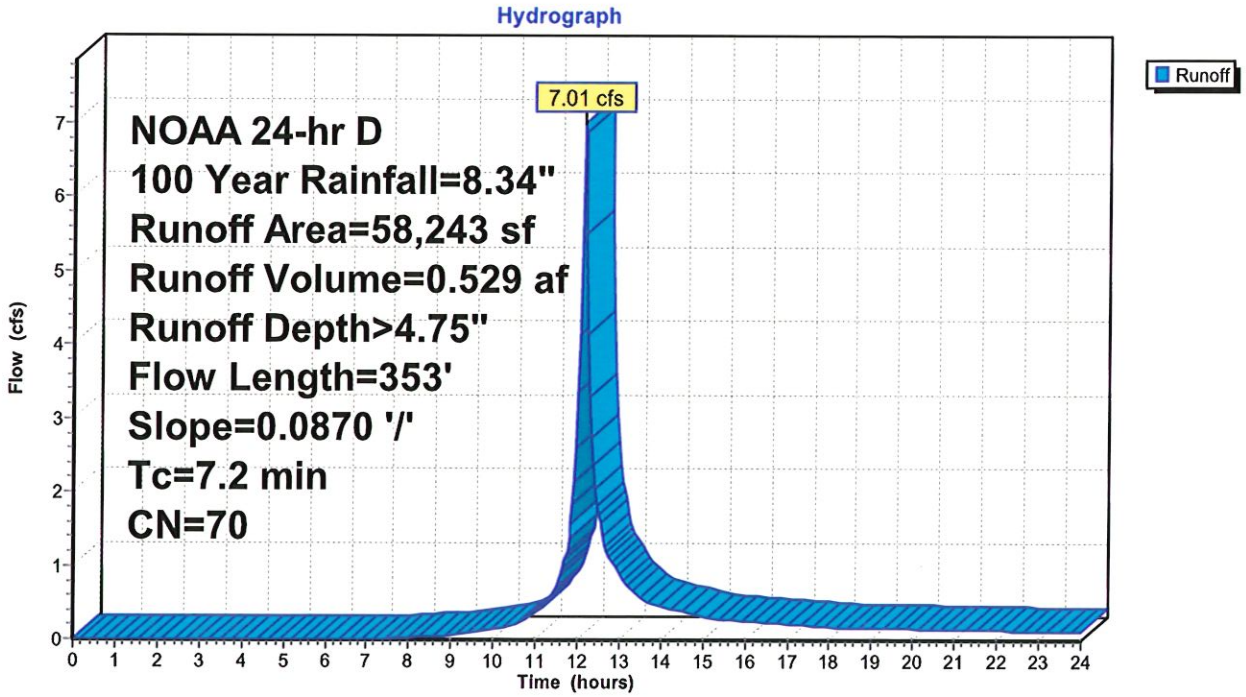
Runoff = 7.01 cfs @ 12.14 hrs, Volume= 0.529 af, Depth> 4.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 100 Year Rainfall=8.34"

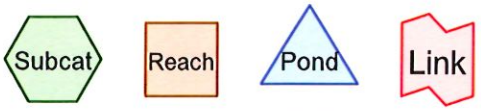
	Area (sf)	CN	Description
*	1,072	98	Buildings
*	1,107	98	Driveway
*	243	98	Concrete slab
	55,821	69	50-75% Grass cover, Fair, HSG B
	58,243	70	Weighted Average
	55,821		95.84% Pervious Area
	2,422		4.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 1S: Existing Conditions



Proposed Conditions



Routing Diagram for 2578ProposedRev2
Prepared by Fairfield County Engineering LLC, Printed 3/7/2025

Summary for Subcatchment 2S: Proposed Conditions

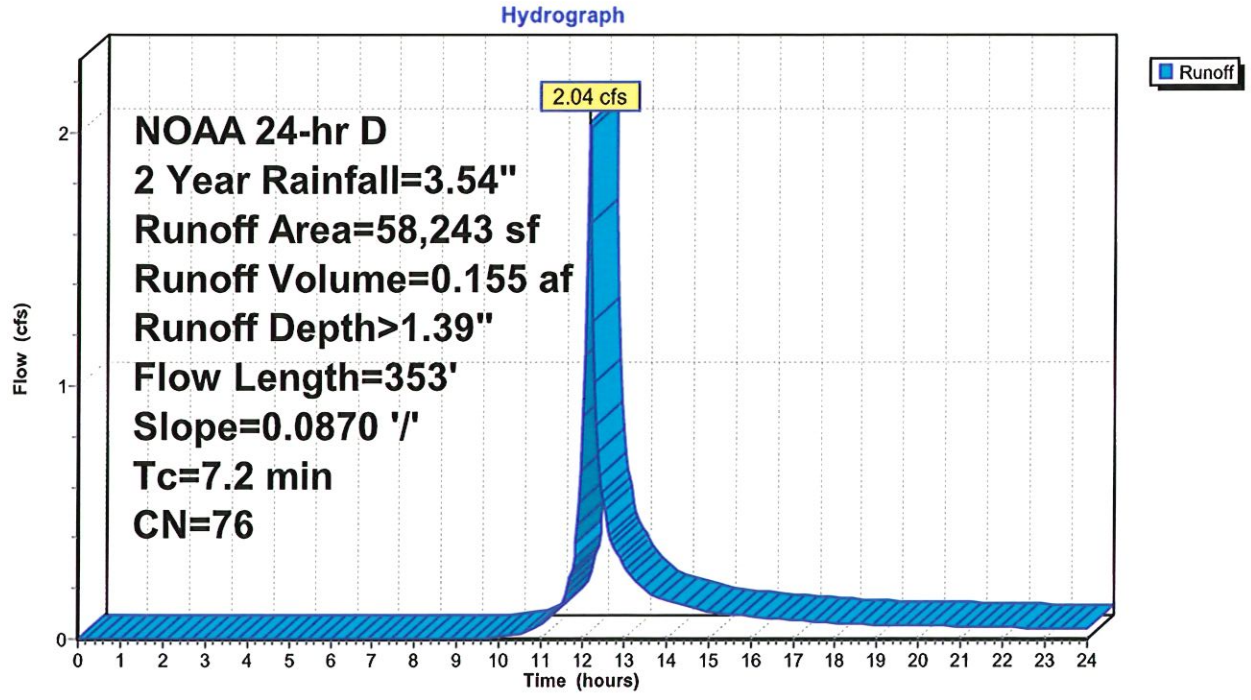
Runoff = 2.04 cfs @ 12.15 hrs, Volume= 0.155 af, Depth> 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 2 Year Rainfall=3.54"

	Area (sf)	CN	Description
*	4,741	98	Building
*	9,018	98	Driveway/Parking
	44,484	69	50-75% Grass cover, Fair, HSG B
	58,243	76	Weighted Average
	44,484		76.38% Pervious Area
	13,759		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 2S: Proposed Conditions



Summary for Subcatchment 2S: Proposed Conditions

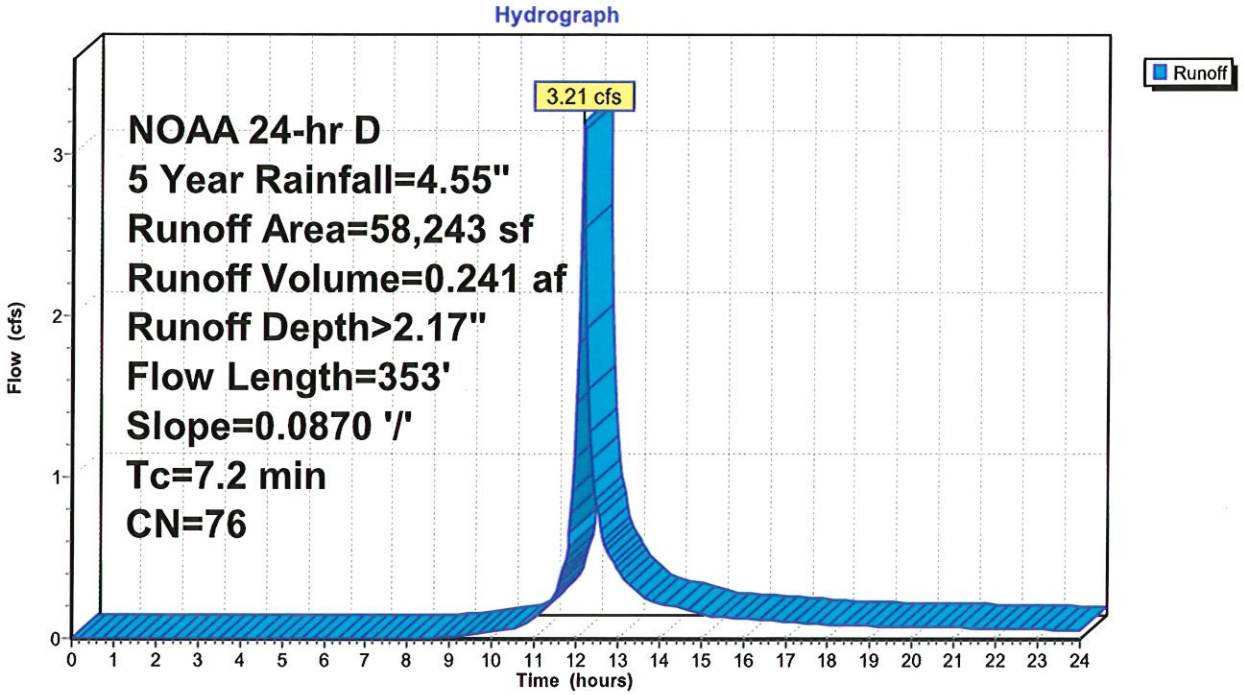
Runoff = 3.21 cfs @ 12.15 hrs, Volume= 0.241 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 5 Year Rainfall=4.55"

	Area (sf)	CN	Description
*	4,741	98	Building
*	9,018	98	Driveway/Parking
	44,484	69	50-75% Grass cover, Fair, HSG B
	58,243	76	Weighted Average
	44,484		76.38% Pervious Area
	13,759		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 2S: Proposed Conditions



Summary for Subcatchment 2S: Proposed Conditions

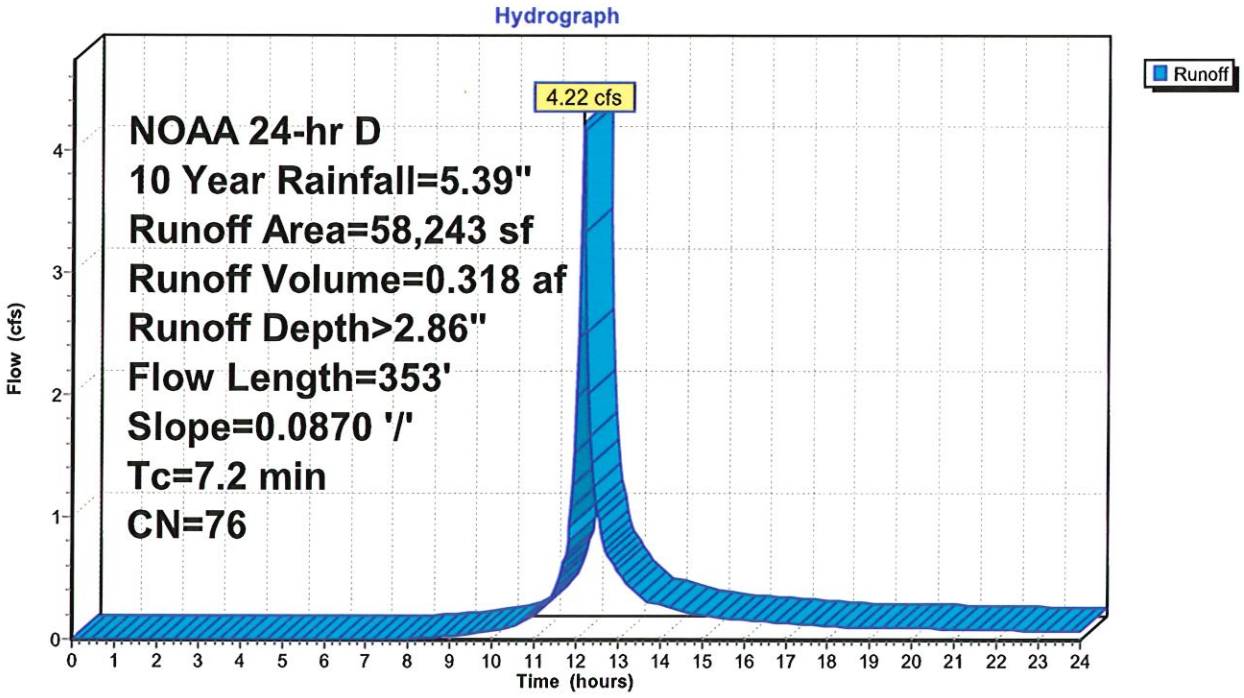
Runoff = 4.22 cfs @ 12.14 hrs, Volume= 0.318 af, Depth> 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 10 Year Rainfall=5.39"

	Area (sf)	CN	Description
*	4,741	98	Building
*	9,018	98	Driveway/Parking
	44,484	69	50-75% Grass cover, Fair, HSG B
	58,243	76	Weighted Average
	44,484		76.38% Pervious Area
	13,759		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 2S: Proposed Conditions



Summary for Subcatchment 2S: Proposed Conditions

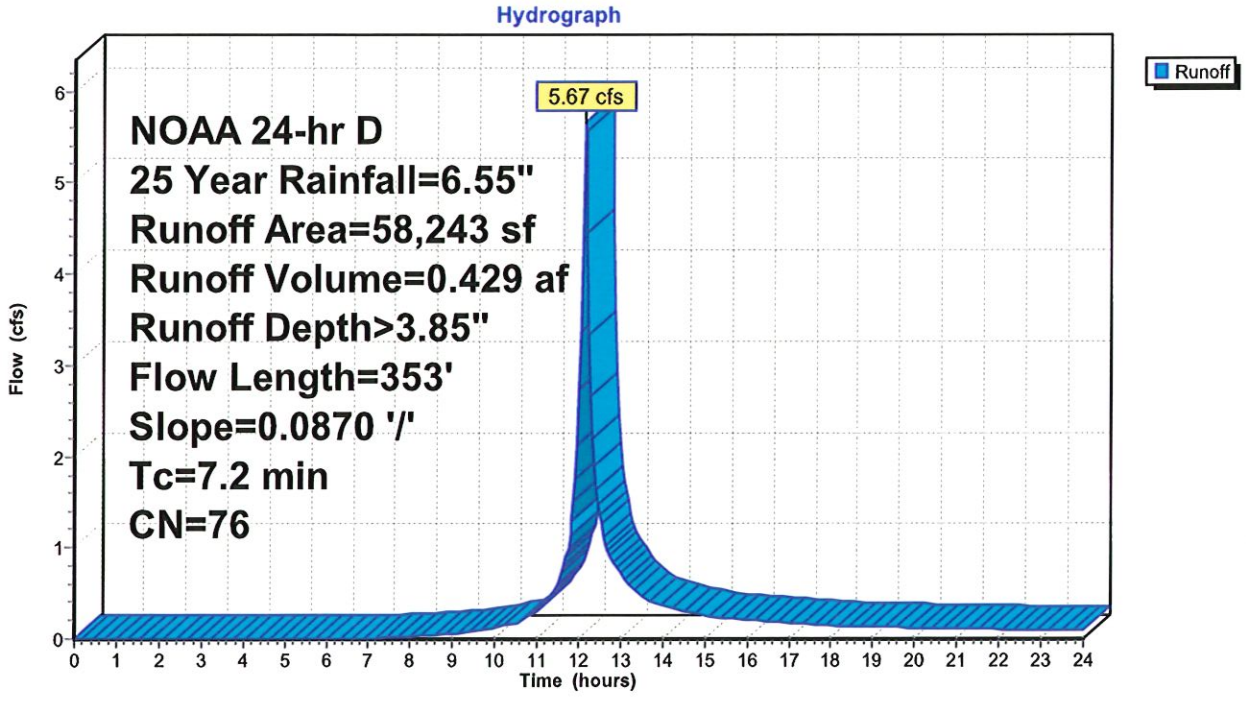
Runoff = 5.67 cfs @ 12.14 hrs, Volume= 0.429 af, Depth> 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 25 Year Rainfall=6.55"

	Area (sf)	CN	Description
*	4,741	98	Building
*	9,018	98	Driveway/Parking
	44,484	69	50-75% Grass cover, Fair, HSG B
	58,243	76	Weighted Average
	44,484		76.38% Pervious Area
	13,759		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 2S: Proposed Conditions



Summary for Subcatchment 2S: Proposed Conditions

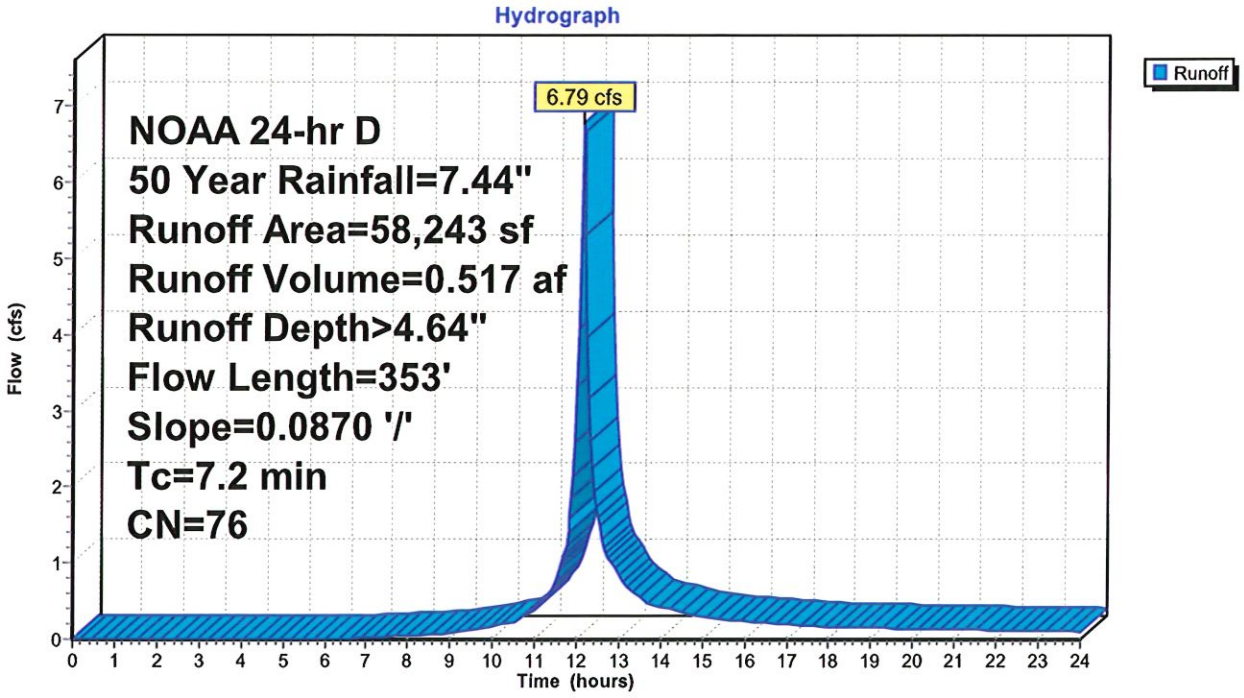
Runoff = 6.79 cfs @ 12.14 hrs, Volume= 0.517 af, Depth> 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 50 Year Rainfall=7.44"

	Area (sf)	CN	Description
*	4,741	98	Building
*	9,018	98	Driveway/Parking
	44,484	69	50-75% Grass cover, Fair, HSG B
	58,243	76	Weighted Average
	44,484		76.38% Pervious Area
	13,759		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 2S: Proposed Conditions



Summary for Subcatchment 2S: Proposed Conditions

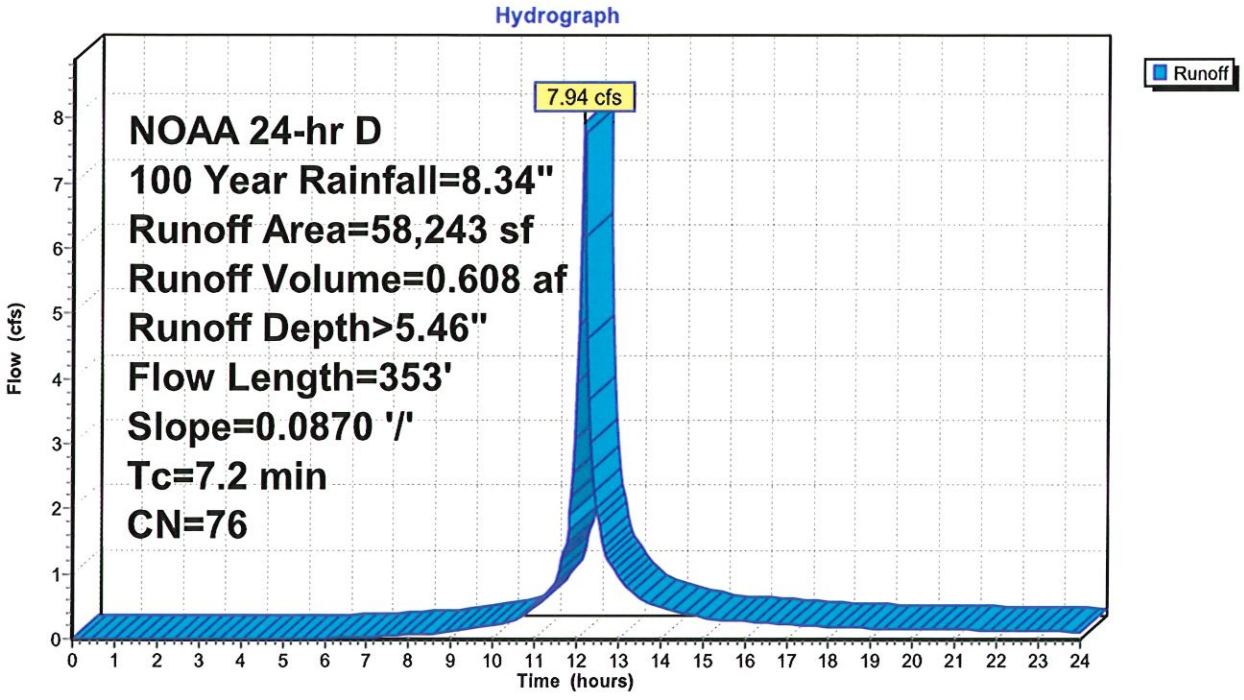
Runoff = 7.94 cfs @ 12.14 hrs, Volume= 0.608 af, Depth> 5.46"

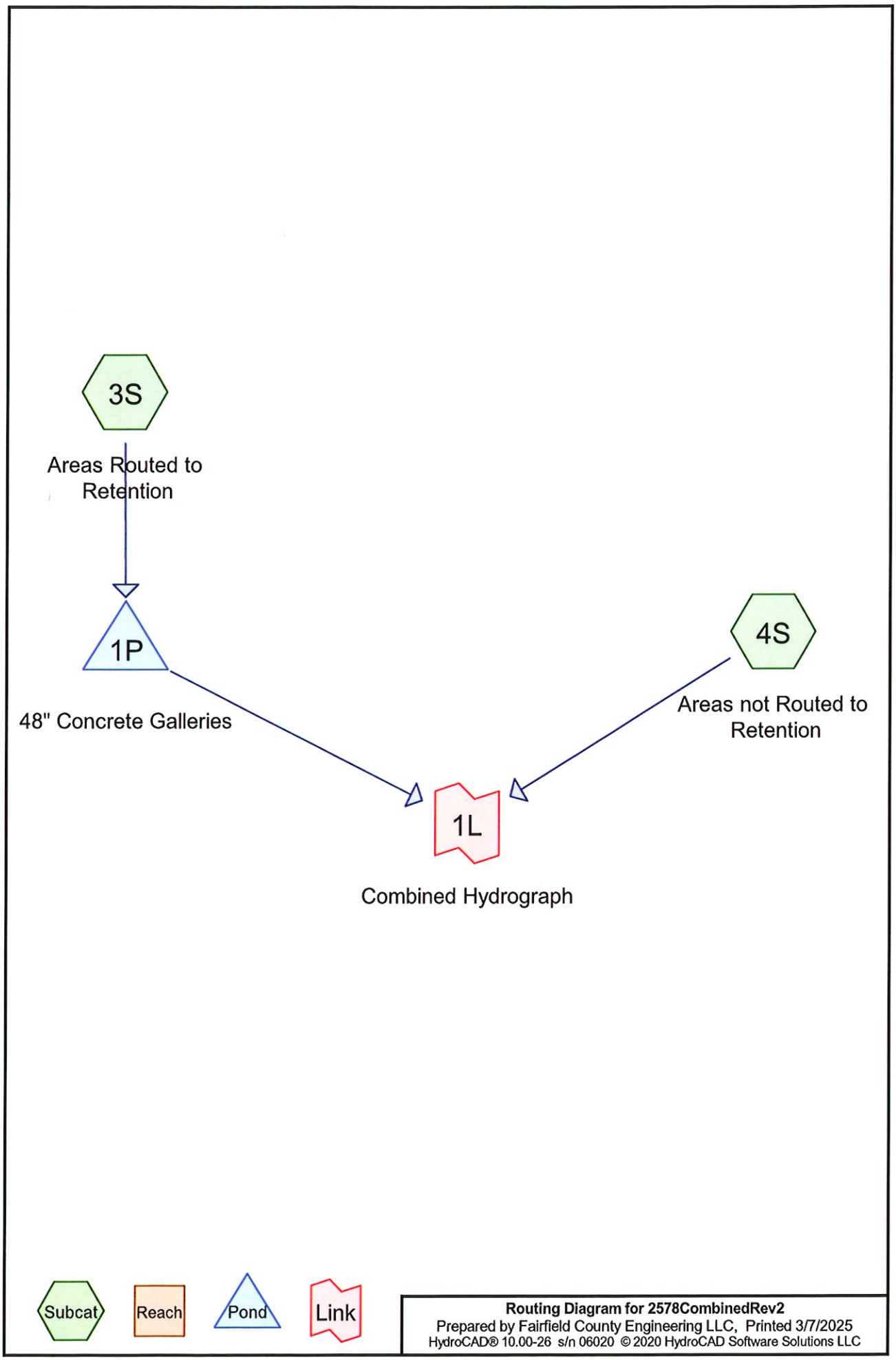
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 100 Year Rainfall=8.34"

	Area (sf)	CN	Description
*	4,741	98	Building
*	9,018	98	Driveway/Parking
	44,484	69	50-75% Grass cover, Fair, HSG B
	58,243	76	Weighted Average
	44,484		76.38% Pervious Area
	13,759		23.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 2S: Proposed Conditions




3S
Areas Routed to Retention
1P
48" Concrete Galleries
4S
Areas not Routed to Retention
1L
Combined Hydrograph
Subcat
Reach
Pond
Link
Routing Diagram for 2578CombinedRev2
Prepared by Fairfield County Engineering LLC, Printed 3/7/2025
HydroCAD® 10.00-26 s/n 06020 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 3S: Areas Routed to Retention

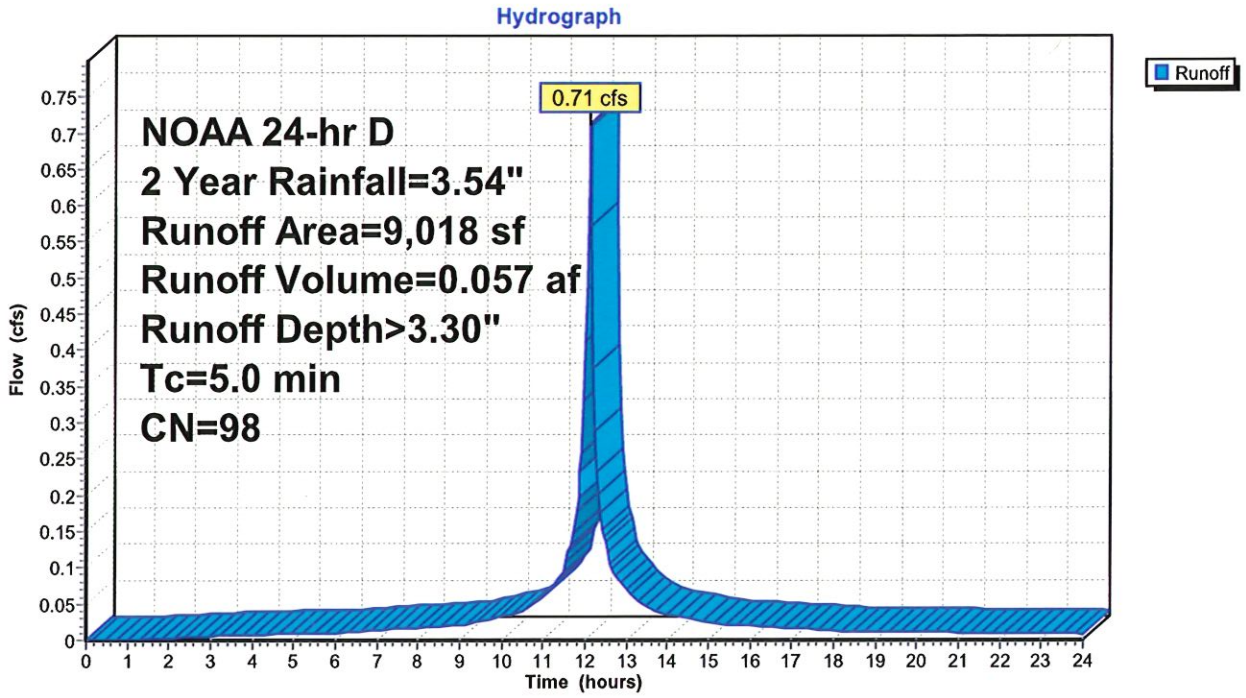
Runoff = 0.71 cfs @ 12.11 hrs, Volume= 0.057 af, Depth> 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 2 Year Rainfall=3.54"

	Area (sf)	CN	Description
*	9,018	98	Driveway/Parking
	9,018		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**

Subcatchment 3S: Areas Routed to Retention



Summary for Subcatchment 4S: Areas not Routed to Retention

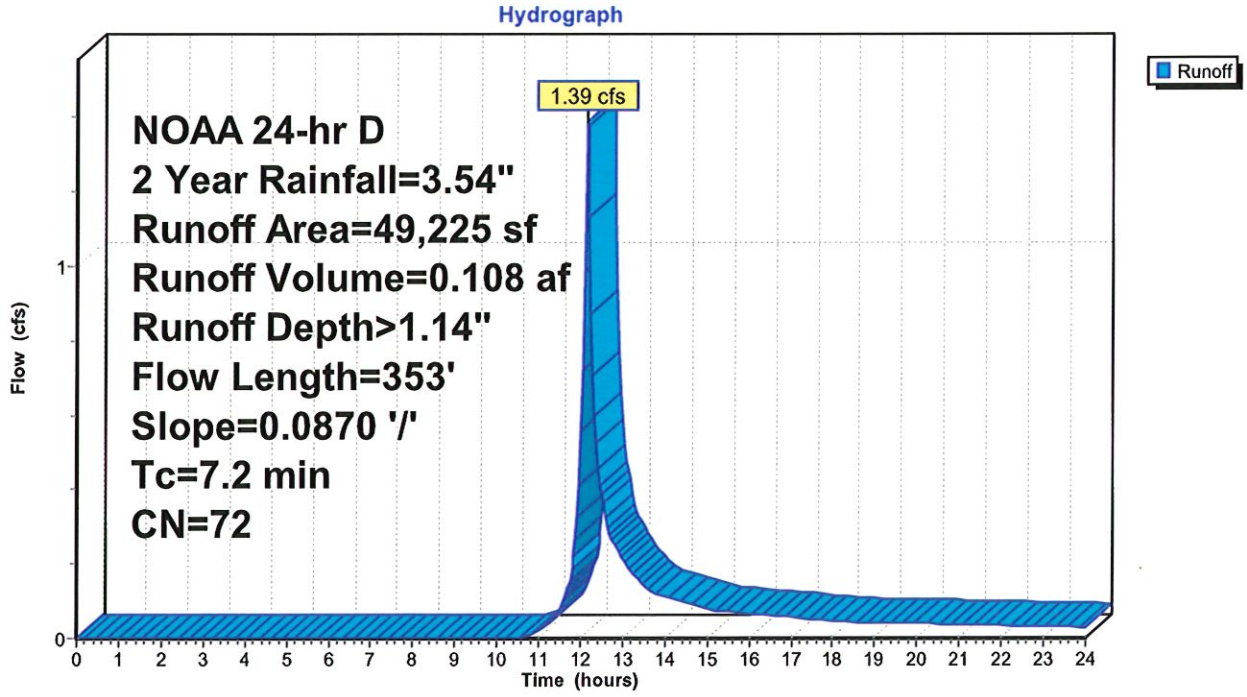
Runoff = 1.39 cfs @ 12.15 hrs, Volume= 0.108 af, Depth> 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 2 Year Rainfall=3.54"

	Area (sf)	CN	Description
*	4,741	98	Building
	44,484	69	50-75% Grass cover, Fair, HSG B
	49,225	72	Weighted Average
	44,484		90.37% Pervious Area
	4,741		9.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 4S: Areas not Routed to Retention



Summary for Pond 1P: 48" Concrete Galleries

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 3.30" for 2 Year event
Inflow = 0.71 cfs @ 12.11 hrs, Volume= 0.057 af
Outflow = 0.07 cfs @ 11.32 hrs, Volume= 0.057 af, Atten= 90%, Lag= 0.0 min
Discarded = 0.07 cfs @ 11.32 hrs, Volume= 0.057 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Peak Elev= 95.49' @ 12.96 hrs Surf.Area= 532 sf Storage= 750 cf

Plug-Flow detention time= 65.2 min calculated for 0.057 af (100% of inflow)
Center-of-Mass det. time= 64.6 min (819.3 - 754.7)

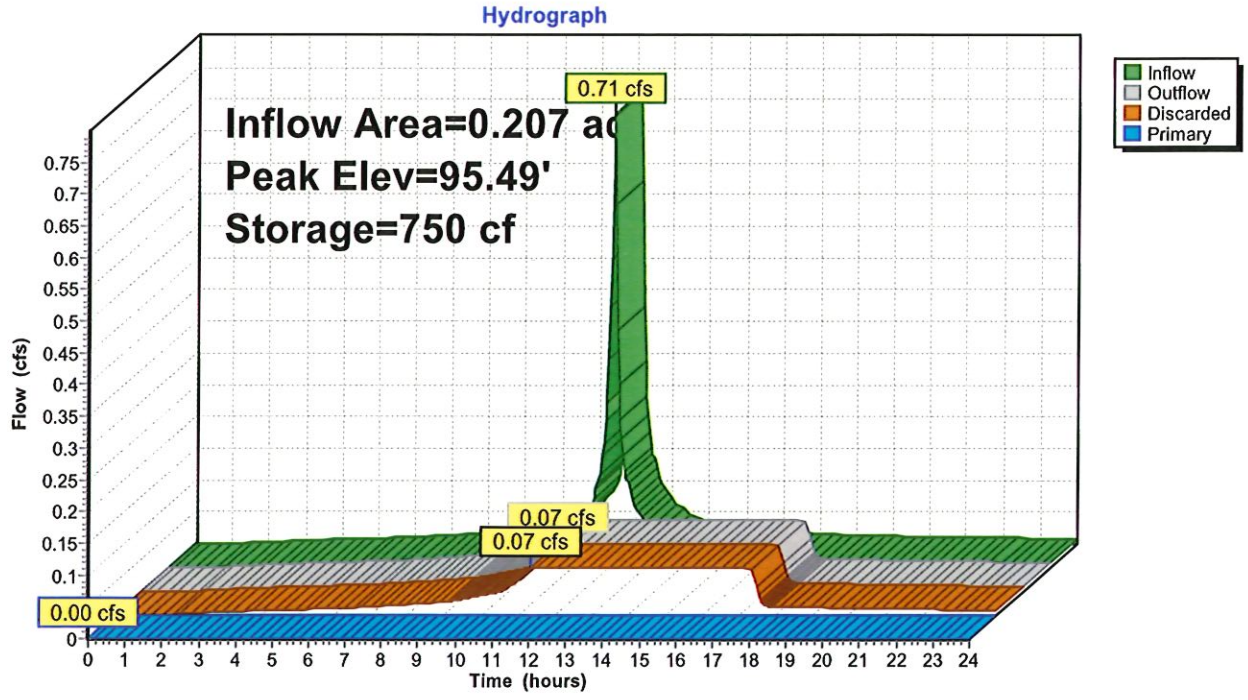
Volume	Invert	Avail.Storage	Storage Description
#1	93.90'	217 cf	**14.00'W x 38.00'L x 4.00'H Stone** 2,128 cf Overall - 1,585 cf Embedded = 543 cf x 40.0% Voids
#2	93.90'	1,585 cf	**12.00'W x 36.00'L x 3.67'H 48" Concrete Galleries** Inside #1
		1,802 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	97.90'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	93.90'	**6.000 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.07 cfs @ 11.32 hrs HW=93.94' (Free Discharge)
↳**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=93.90' (Free Discharge)
↳**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: 48" Concrete Galleries

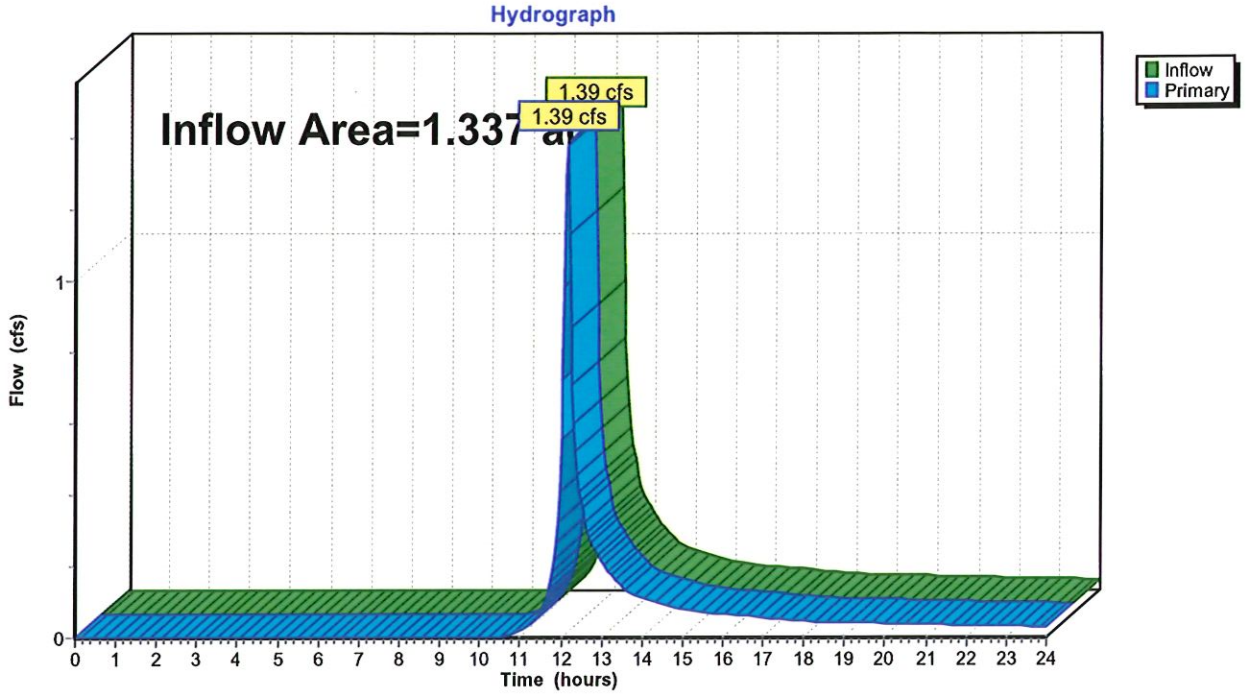


Summary for Link 1L: Combined Hydrograph

Inflow Area = 1.337 ac, 23.62% Impervious, Inflow Depth > 0.97" for 2 Year event
Inflow = 1.39 cfs @ 12.15 hrs, Volume= 0.108 af
Primary = 1.39 cfs @ 12.15 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs

Link 1L: Combined Hydrograph



Summary for Subcatchment 3S: Areas Routed to Retention

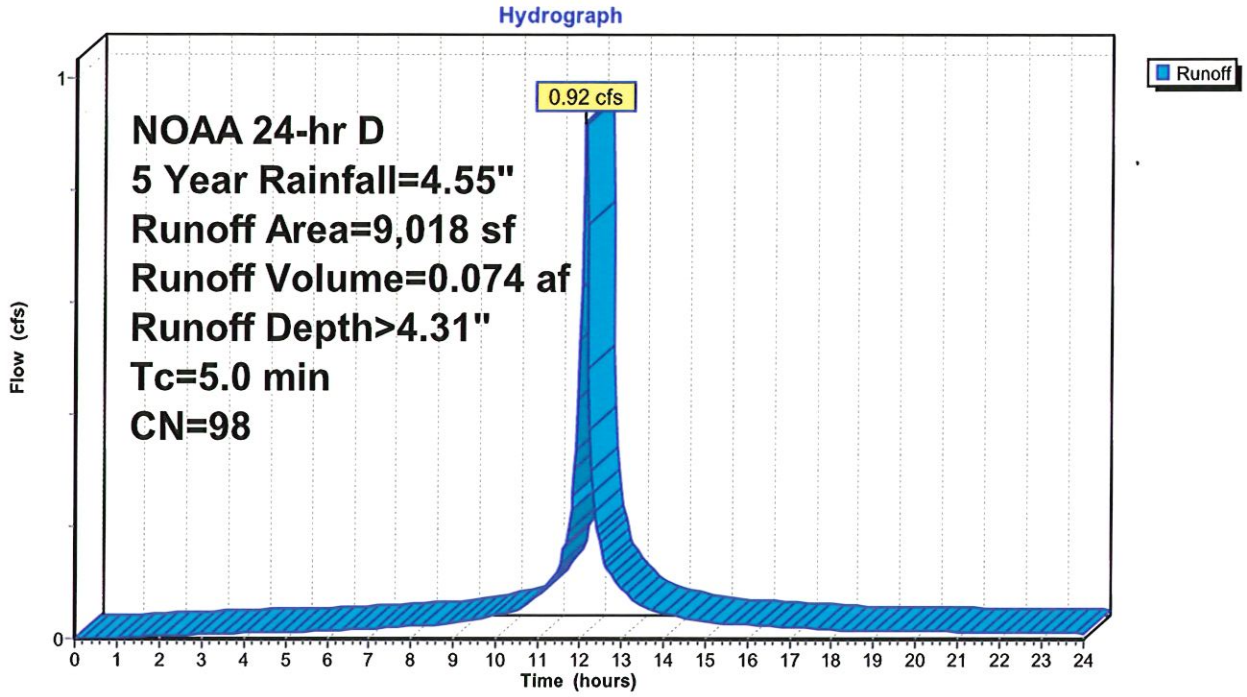
Runoff = 0.92 cfs @ 12.11 hrs, Volume= 0.074 af, Depth> 4.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 5 Year Rainfall=4.55"

	Area (sf)	CN	Description
*	9,018	98	Driveway/Parking
	9,018		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Direct**

Subcatchment 3S: Areas Routed to Retention



Summary for Subcatchment 4S: Areas not Routed to Retention

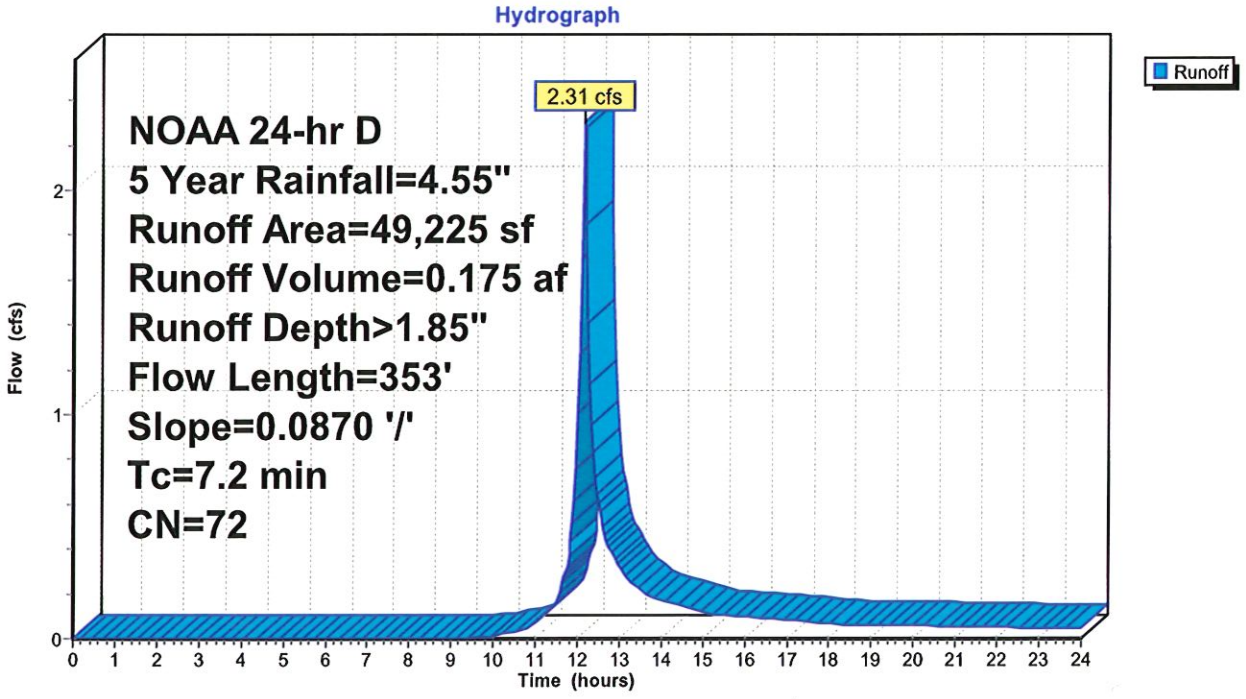
Runoff = 2.31 cfs @ 12.15 hrs, Volume= 0.175 af, Depth> 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
NOAA 24-hr D 5 Year Rainfall=4.55"

	Area (sf)	CN	Description
*	4,741	98	Building
	44,484	69	50-75% Grass cover, Fair, HSG B
	49,225	72	Weighted Average
	44,484		90.37% Pervious Area
	4,741		9.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	100	0.0870	0.32		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.54"
2.0	253	0.0870	2.06		**Shallow Concentrated Flow, Shallow Concentrated Flow** Short Grass Pasture Kv= 7.0 fps
7.2	353	Total			

Subcatchment 4S: Areas not Routed to Retention



Summary for Pond 1P: 48" Concrete Galleries

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 4.31" for 5 Year event
Inflow = 0.92 cfs @ 12.11 hrs, Volume= 0.074 af
Outflow = 0.07 cfs @ 11.04 hrs, Volume= 0.074 af, Atten= 92%, Lag= 0.0 min
Discarded = 0.07 cfs @ 11.04 hrs, Volume= 0.074 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.04 hrs
Peak Elev= 96.27' @ 13.22 hrs Surf.Area= 532 sf Storage= 1,116 cf

Plug-Flow detention time= 104.4 min calculated for 0.074 af (100% of inflow)
Center-of-Mass det. time= 103.7 min (853.3 - 749.6)

Volume	Invert	Avail.Storage	Storage Description
#1	93.90'	217 cf	**14.00'W x 38.00'L x 4.00'H Stone** 2,128 cf Overall - 1,585 cf Embedded = 543 cf x 40.0% Voids
#2	93.90'	1,585 cf	**12.00'W x 36.00'L x 3.67'H 48" Concrete Galleries** Inside #1
		1,802 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	97.90'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	93.90'	**6.000 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.07 cfs @ 11.04 hrs HW=93.94' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=93.90' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 1P: 48" Concrete Galleries